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ABSTRACT

Reviewing and incorporating previous research findings, this essay develops a paradigm for future research on the contribution of school administration to student achievement. The paradigm focuses on the discretionary behavior of school administrators in an attempt to yield implications for policy and practice as well as for research. The intention is to inform and encourage administrators and their supporters who attempt to improve student achievement. The paradigm is presented in three stages. First, classroom variables that affect student learning are identified. Second, the effects of educational policy on administrators is reviewed. Third, the influence of administrators (in terms of both work supervision and work support) on classroom variables is highlighted. Briefly, according to the paradigm, educational policy affects administrative work, which affects classroom work, which in turn affects student achievement. Research to study more specific relationships in this chain of influences is proposed. (Author/JM)

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Linking Educational Policy and Management with Student Achievement

by

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Introduction

This essay develops a paradigm for future research on the contribution of school administration to student achievement that incorporates models supported by empirical study. The paradigm focuses on the discretionary behavior of school administrators in order to yield direct implications for policy and practice as well as for research. Our intention is to inform and encourage administrators and their supporters who attempt to improve student achievement.

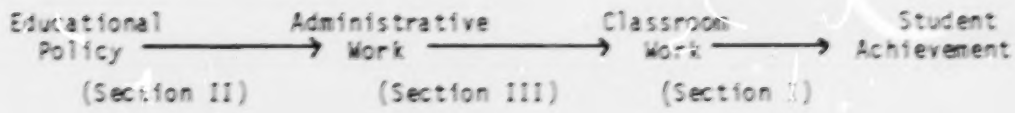
The paradigm has been developed under the auspices of the Center for Educational Policy and Management (CEPM) at the University of Oregon, with support by the National Institute of Education. It is intended to strengthen the research program at CEPM and is also addressed to researchers at other institutions who are pursuing the study of school effectiveness.

The intellectual motivation for this paradigm development effort is the unresolved question of schooling effects research over the last decade and a half (Coleman 1966; Averch et al. 1970; Bridge et al. 1979). The recent emphasis on human resource management in schools (Murnane 1980) seems to shift the focus of such research to school administration. Here, however, a contradiction has arisen between some research findings that suggest a weak linkage between school administration and classroom processes presumed to affect student achievement (Meyer and Rowan 1977; Meyer, Scott, and Deal 1979) and others that support the importance of administrative leadership and "gatekeeper" functions in improving student achievement (Berman and McLaughlin 1978; Herriott and Gross 1979; Edmonds 1979; Salganik 1980). A paradigm for research is needed to

resolve this contradiction. Similar attempts by Erickson (1977), Dreeben (n.d.), and Bossert (1981) bolster our efforts.

The paradigm is presented in three stages. First, we identify the classroom variables that must be altered to improve student learning. The nucleus of the paradigm is based on recent research on classroom factors that predict certain dimensions of student achievement. We recognize both the potential technology for efficacious and efficient instruction and the limitations of this technology that make teacher and student discretion important. Second, we characterize the administrator as the agent of educational policy. We draw upon the work of colleagues to outline the conditions under which administrators will try to improve student achievement. Third, we provide a conceptualization of administrative influence on classroom variables in management of schools. We distinguish work supervision from work support as complementary management strategies for administrators who attempt to improve student achievement. The following diagram (Figure 1) depicts the framework for paradigm development and indicates how each of the following sections of the paper contribute to this development.

Figure 1. The Initial Stage of Paradigm Development



I. Classroom Work and Student Achievement

Paradigm development begins with the specification of a criterion variable and proximal predictors of this variable. Inasmuch as the contribution of school administration to student achievement is mediated by the events of classroom life, classroom variables and their relationship to achievement are the focus of this section.

Student achievement is a complex variable for a research paradigm. We do not need to reinvent the wheel, however. Emphasis will be given the basic skills in language and mathematics and the basic cognitive operations that have been of prime concern to curriculum developers during the twentieth century (Bloom et al. 1966; Walker 1978). These skills and cognitive operations have been institutionalized as criteria for the evaluation of school effects on students in such widely-used and nationally-normed tests as the Comprehensive Test of Basic Skills. In reality, a "basic education" has come to be what is measured by such tests. The failure of some schools to provide a basic education (as defined by these tests) for some of their students forms the political context for much of the research to be reviewed in this essay. We do not intend to limit the paradigm to such cases, however. Schools are also evaluated in terms of the "basic education" they provide for students who go on to pursue more advanced and specialized training. The appropriate skills and cognitive operations for these pursuits have been institutionalized in other tests, such as the Scholastic Aptitude Test, used for placement in such training. Here, also, some schools fail some students. At present, the research base is stronger on predictors of the more elementary levels of achievement, and paradigm development proceeds more confidently at these levels.

The paradigm, however, is open to adaptation with respect to predictors of higher levels of achievement, and suggestions will be made for such adaptation.

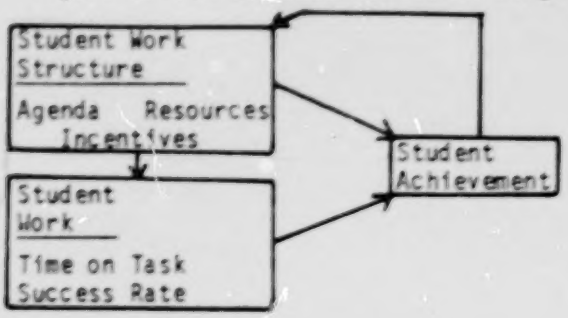
Increments in student achievement over a period of time reflect student and teacher behavior in the classroom. There is a long tradition of research on the effects of student and teacher behavior on achievement (Gage 1978; Hoge and Luce 1979; Centra and Potter 1980). It has proven difficult to isolate specific behaviors that predict achievement. Teacher task focus and student attention are the most commonly accepted predictors. These are simplistic ways to characterize classroom events, however. Administrators who try to improve achievement by insisting on continuous busyness in the classroom run the risk of being regarded by teachers as hindrances rather than contributors to their instructional efforts.

More recently, attempts have been made to characterize the nature of task involvement of students and teachers in a more sophisticated fashion. Doyle (1978, 1979a, 1979b) has argued that greater attention needs to be given to student understanding of learning tasks and how this is influenced not only by teacher behavior but also by the classroom ecology of tasks. Dreeben (1978) has emphasized teacher management of the collective classroom work activity. A common theme is that learning stems from purposeful effort or work on the part of students. Student work in turn responds to work conditions. The important work of the teacher is to establish and maintain the work conditions of the student.

Three work conditions can be distinguished. Work has an agenda or orientation to instrumental means and desired ends. Work depends upon available resources. The level of work effort reflects the strength of

incentives. We call the configuration of these conditions a work structure. The first step in paradigm development, therefore, is to substitute these terms for "classroom work." This is shown in Figure 2.

Figure 2. Student Work in the Paradigm



With respect to basic skills and cognitive operations, educational research has made progress in identifying work and work structure variables that predict achievement. Using Carroll's (1963) influential model of learning, researchers have assumed that learning is a function of a work structure factor -- the time needed by a student to master a task -- and a work factor -- the time spent by a student on that task. In this model, the task of the teacher is to structure the student's work so as to reduce time needed while keeping the student on task. Bloom's (1976) model of mastery learning builds on Carroll's model by having teachers adapt student work agenda to student resources for work--ie., the mastery of prerequisite tasks. Bloom reported substantial reductions in time needed for subsequent tasks and increases in students' efficient use of task time as a consequence of this teaching strategy. The improvement in time-on-task, however, is explained as a function of reinforcement for successful performance rather than as a function of teacher supervisory behavior, and this is problematic.

In an independent effort to develop Carroll's model, Harnischfeger and Wiley (1976) used a "backward mapping" strategy (Elmore 1979) to describe the hierarchy of managerial decisions that determines the amount of time students do spend on task. They attempted to predict achievement with time allocation variables amenable to alteration by administrators--length of school year, length of school day, attendance rate. Initial supportive findings, however, have not been replicated (Wiley and Harnischfeger 1974; Karweit 1976). Refinement of such variables continues (Thomas et al. 1978-79). In any case, the analysis of time spent is only half the problem; analysis of time needed is equally important.

Recent evidence from the Beginning Teacher Evaluation Study (BTES) provides the first construct of student work that combines these two time factors (Fisher et al. 1980). "Academic learning time" (ALT) is defined as the amount of time students spend working, with few errors, on tasks that are relevant to classroom learning objectives. ALT is thus a result of teacher time allocations and student use of that time, and it is also a result of the coherence of curriculum and appropriateness of task assignment rules. ALT has been shown to predict student achievement gain on tests of the learning tasks covered. Thus, administrators desiring to improve student achievement on particular dimensions need to increase ALT on those dimensions.

The BTES study indicates several teacher work variables that predict either ALT or achievement. These include planning work (diagnosis and prescription), which keeps classroom tasks relevant to the curricular objectives and appropriate to student readiness levels, and instructional work (presenting task content, monitoring student work, providing feedback

on student progress), which guides student work efforts and keeps students on task. These teacher work variables create a student work structure. They establish a work agenda (tasks prescribed, content presented, feedback provided), allocate resources to the agenda (diagnosed student readiness, teacher interaction with student, use of time), and generate incentives (student work monitored and evaluated). Teacher work then sustains the student work structure and controls student work. This instructional approach has been called "direct instruction" in contrast to the open education approach, dominant during recent decades, which made student interest and explorations the driving force for classroom work. A number of other studies (e.g., Hanson and Schutz 1978; Cooley and Leinhardt 1980) have confirmed the efficacy of direct instruction with respect to student work and student achievement at basic skill levels. In addition, Stallings' work (1980) indicates the efficacy of direct instruction for basic skills achievement in remedial secondary school programs. Furthermore, direct instruction has been incorporated into the design of programmed instructional technologies like DISTAR, which prescribes teacher work to initiate and sustain student work structures and student work (Becker and Carnine 1980). DISTAR has been shown to be effective with the low-achieving, low-income student populations (Stallings 1975).

There is a strong foundation, therefore, for deriving implications for administrative control of teacher work where direct instruction is indicated in order to improve student achievement. Gersten and Carnine (1981) and Stallings (1979) have all suggested administrative contributions that can be made to the operation of direct instruction programs. Where a particular instructional package is used, the administrator's task is to ensure implementation of that package.

In identifying teacher work variables subject to administrative control, however, we must analyze the teacher work situation in the same way we analyzed the student's situation. Teachers work within agenda, resource, and incentive parameters that are determined by a variety of factors. School administrators assign grades, subjects, and students to teachers; provide a school time schedule; and require periodic evaluation of student work. School administrators also influence who is selected to teach in a particular school, the material resources available to teachers, and the compensation and sanctions contingent upon work behavior. Administrators are therefore in a position to create a teacher work structure that satisfies the demands of various instructional approaches. However, in managing student work structures, teachers themselves make decisions about the final specification of their own work structure. For example, teachers who only partially implement DISTAR increase the flexibility of their own work agenda, allocate time to other tasks, and, in all likelihood, restore some of the psychic rewards from personal interaction with students that DISTAR can suppress (Lortie 1975). Therefore, it has proven difficult for project directors or administrators to control teacher work structures according to the requirements of direct instruction, even where those requirements are specified in such detail as with DISTAR (Carnine 1981).

Administrator control of teacher work structures for the purpose of improving student achievement is even more difficult to accomplish where instructional tasks are less easily programmed, implemented, or shown to be productive. Such is the case, we argue, as learning objectives include more of the "higher-order" cognitive operations described in Bloom (1966)

and as students mature. The research paradigm needs to address the full range of school effects on student achievement, and this means that we extend our notion of basic education and its predictors to such higher-order objectives in language and mathematics achievement and to the basic knowledge to be learned by the secondary school student.

This paradigm extension can benefit from the model of task control developed by Dornbusch and Scott (1975). The task control model is, in essence, a more general formulation of the BTES teaching model. Instead of diagnosis, prescription, presentation, monitoring, and feedback, Dornbusch and Scott refer simply to task assignment, criterion setting, performance sampling, and performance evaluation. This allows for cases where tasks and criteria are problematic rather than easily prescribed, where the relationship of presentation to prescription varies, where sampling rather than continuous monitoring of student performance is adequate, where evaluation must be of complex products and processes and performed occasionally rather than continuously. Such cases arise with teacher and student work on higher-order objectives and in secondary school classrooms. Hence the Dornbusch and Scott model extends our paradigm to situations where the BTES teaching model may not be applicable.

For example, where the nature of learning makes tasks less fully prescribable and criteria difficult to identify in advance, Dornbusch and Scott's model of task control suggests that a certain amount of discretion be delegated to students about how to proceed on a task and how much to attempt. In a sense, the student has to internalize the BTES teaching model with respect to the student's own work. The student has to "learn

how to learn," and this requires self-management. The teacher's work in this case is to elicit student statements of objectives and procedures and to inspect completed assignments for evidence of work and level of cognition. These activities are appropriate to teaching writing and math and to guiding such independent student projects as library reports and community research papers, which assume increasing importance in secondary school. The problem for administrators here is how to provide teachers with a work agenda, resources, and incentives that allow and motivate them to hold students accountable for their work while permitting them a measure of latitude in its execution. Teachers need out-of-class time or assistance for designing and evaluating student assignments. Teachers also need skills in guiding students' independent study of textual material, a different process from providing direct presentation of all content to be learned. Where student learning is accompanied by a higher error rate in work than the ALT construct of the BTES study indicates, teachers have to know how to sustain tension in student work. Maintaining a steady diet of student success is not always possible or advisable. Without skill in managing tension, teachers are apt to revert to easy task assignments in order to preserve what Doyle (1979a) calls a "performance-grade exchange" conducive to student docility rather than to learning.

Higher-level cognitive operations are thus tasks that challenge the designs for instruction that have proven successful with lower-level operations. A similar challenge is posed by the task of teaching in secondary schools. The BTES teaching model, direct instruction, and DISTAR are founded on the elementary school classroom situation. As

elements of this situation relevant to work agenda, work resources, and work incentives for teachers and students change, the teacher's job in managing student work structures changes. A few remarks on each of the changes should indicate the direction for modifications in the paradigm where the research topic is secondary school instruction.

First, the work agenda for elementary school teachers is to teach reading, language arts, math, and assorted marginal subjects to classes of 20 to 30 students. These teachers focus directly on skills and cognitive operations and work in some depth with individual students. As one moves to higher elementary grades, this pattern begins to change, and the focus is likely to shift to skills and cognitive operations in particular subjects. In secondary school, the agenda shifts from mastery of skills to exposure to diverse content. A continued emphasis on skills and cognitive operations creates problems. Secondary teachers, furthermore, are trained in specific subjects and tend to shift their attention to content. The higher levels of cognitive processes associated with content coverage (e.g., synthesis) are difficult to teach directly or to observe. Hence teachers must more often delegate procedural control to students and act as evaluators of the quality of end products of student work. Furthermore, the large number of students taught increases the number of end products. Hence the teacher's work structure consists of providing initial orientation and guidance and then assessing final work products. Individualized task prescription, and criterion setting, and feedback on process are very difficult.

The incentives for teacher and student work also change. No longer is the direct quasi-parental relationship easy to achieve. Students are more strongly influenced by peer incentives (Coleman 1962). They are likely to challenge teachers and are more ambivalent about teacher approval. Rewards for student practice and drill on skills become inoperable as incentives. Moreover, students are alienated by the compulsory attendance laws and the regimentation of secondary school organization. There is a danger that teachers will become reluctant to risk confronting students about performance errors. Dornbusch and colleagues (Dornbusch et al. 1974; Fernandez et al. 1975) have argued that secondary school students' efforts wane when teachers are indiscriminate with praise. Teachers need to be given work incentives to avoid this pattern.

In this situation, providing a teacher work structure that directs, supports, and motivates teachers to continue developing student basic skills and cognitive operations is a formidable challenge to administrators. Research is needed on current attempts to make reading and writing central curricular goals for secondary school humanities courses.

In addition to the changing nature of teachers' work as students mature, the work structures of teachers are incorporated in intermediate management units. Whereas the image of the "flat" organizational structure of schools applies to the early elementary grades, in the later elementary grades there are likely to be teaming arrangements for subject-matter specialization or ability-grouping of students. These arrangements reveal teachers' managerial decisions about student work structures and

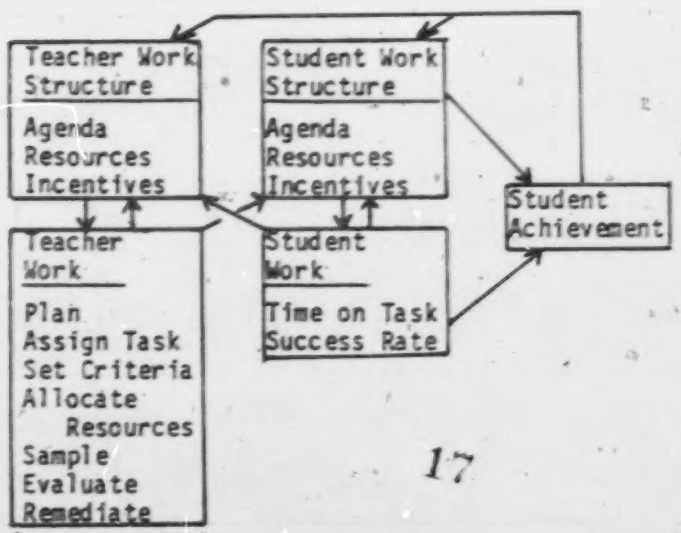
they also reveal teachers' preferences for their own work structures. As Cohen and her colleagues (1976) argue, the more unpredictable the teaching task, the more likely teachers are to turn to collegial groups for mutual assistance.

Secondary school departments provide a more formal layer of organization between school administration and classroom work. Such departments coordinate the assignment of agenda to teachers, allocation of resources among courses, and incentives for pursuing different objectives with different students. They are likely to focus agenda on subject matter content coverage, stratify students according to their "seriousness" (an image likely to reward teachers' professional self-perceptions), and reward or punish teachers with course assignments. How teachers' individual preferences are combined into the work structure of the separate departments, and how each department operates in the increasingly political structure of the school are matters for research on the value of administrative attempts to improve student achievement through controlling teacher work structures (Firestone and Herriott 1980).

Furthermore, it is apparent that many of the basic teaching variables of the BTES research are performed by specialists outside the secondary school classroom. Counselors diagnose and place students in courses, evaluation and testing personnel in district offices monitor student acquisitions and retention of basic skills as well as cognitive operations that cut across many subject areas, and administrators may routinely handle student academic and behavioral problems. This division of labor

in basic teaching functions, added to the increasing difficulty of directly controlling student work, explains some of the problems in basic education at the secondary level. There have been attempts to reorganize these functions within the purview of a single teacher, reflected in the shift from junior high to middle school organization and the establishment of the homeroom or guide teacher in high schools. However, such attempts deal more with the basic incentives for teaching and studying--a strong personal relationship between teacher and student--than with agenda and resource problems. In any event, it is apparent that administrators have a more complex target for efforts to improve achievement in the secondary school. In particular, they have to deal with a number of feedback and reciprocal influence loops in the paradigm. Teacher work structures are increasingly influenced by teacher decision-making, individually and collectively, which is increasingly influenced by the problem of managing student work through delegation and dependence on ancillary personnel. Some of these loops are indicated in Figure 3.

Figure 3. Teacher Work in the Paradigm



We began this section with the most specific formulation of classroom work structure, teacher and student work, and achievement variables that is available to mediate potential administrative contributions to learning. Where highly-programmed technologies are present, administrators simply need to monitor their implementation and provide the necessary resources and incentives for teachers to continue the program. Where such technology is unavailable, administrators can at least sustain the work structure variables that engage teachers in diagnosis, prescription, presentation, monitoring, and feedback work as described by the BTES study. Where the nature of instructional tasks makes the BTES model insufficient, administrators can improve agenda articulation and coherence, resource enhancement and application, and incentive saliency as required by the nature of the task and local circumstances. We argue that effective administration in these more complex conditions requires increasing cooperation with teachers and students in the management of their own work structures, and we shall have more to say about this in Section III.

Our difficulty in coming to grips with agenda, resources, and incentives as alterable variables in the improvement of learning reflects more than the complexity of the classroom. It also reflects the ambiguity of society's commitment to basic education. From the student's perspective, this ambiguity brings into question teachers' authority to control classroom work to improve achievement. In teachers' eyes, it also undercuts administrators' authority. For these reasons, and in order to understand what drives administrators to attempt to improve achievement, we

must step back and look at the conditions of administrative work before moving to the prime question of how administrators can be effective in managing instructional programs.

II. Educational Policy: The Context of Administrative Work

Having raised and partially answered the question of the proximal predictors of student achievement, and having suggested the sensitivity of such predictors to administrative practice, we turn to the question of where and when administrative work is oriented toward improving student achievement. What determines administrative discretion in the management of teacher and student work structures and, through them, student achievement? Inasmuch as the focus is now on the management work of administrators as a dependent variable, we should look at the work situation of administrators and the agenda, resources, and incentives defining that work situation. The key component of this situation is school district policy.

School administrators -- superintendents, special district administrators, and building principals -- are hired to carry out school district policy. Policy may be viewed narrowly as the official decisions of local school boards, but we prefer to take the broader view of policy as the ongoing process of integration of purposes and intentions espoused by the variety of social groups and agencies possessing power over school operations. Policy as a process is partially encoded in formal school board decisions. Policy also evolves as a complex of shared perceptions and understandings that serves as a context for the interpretation of school board decisions. Through public pronouncements of powerful parties, this broader source of policy is a direct influence on administrative behavior.

School administrators regard it as their job to improve student achievement when policy calls for such improvement. This call may come from community groups and agencies other than the school board, from teachers

and students or their representatives, or from higher levels of government -- state boards of education and legislatures, federal agencies, Congress, and the courts. The paradigm alerts researchers to the differential power and substantive demands of these environmental agents in predicting school board decisions and administrative implementation of those decisions. What are the various attempts to define work agenda, control work resources, and apply work incentives that the administrator must reconcile in managing school districts and schools?

Current thought about this context of policy making could serve to dampen any attempt to develop a paradigm of administrative effects of student achievement. Meyer and his colleagues (Meyer and Rowan 1977; Meyer, Scott, and Deal 1979) have reminded us that schools and school districts have evolved from wide-spread consensus over time and across social groups about the central myths and ceremonies of education. School policy is thus largely implicit in shared perceptions and understandings about what students, teachers, and administrators are supposed to do. Language for thinking and talking about school has grown out of the rites of passage to adulthood, and this language has been institutionalized in state codes about the conferring of educational credentials on students. It includes an agenda of subjects and courses; resources categorized in terms of teacher credentials, student age, and the length of the school year; and incentives, culminating in the high school diploma, which is contingent upon accumulation of courses and the record of time expended by students.

The work of administrators in this context is to keep the operation going, not to improve student achievement. A similar situation exists for teachers. There are no criteria established for administrative or teacher performance affecting student achievement; there is no flexibility

in resource allocations to boost achievement; and there are no incentives for exceptional contribution to student achievement comparable to the salary incentives intended to ensure continued operation of the schools. In response to the contradiction between policy emphasis on providing status to students and the evidence that students lack skills, educators choose to suppress the evidence. It is more important that low-achieving students "get" an education -- i.e., a diploma -- than that they become educated.

Common sense confirms the truth in this inconsistency. Indeed, parents, students, and teachers do know what is supposed to happen in school, independent of any administrative pronouncement or school board decision. The environment of the school, furthermore, is perceived to reward conformity to school ceremonies and allegiance to school myths, hence, teachers and students produce the sorts of student achievement honored in such an environment without tight organization of effort or control by administrators. At least, this may have been true in recent decades when society enjoyed considerable power to reward educational credentials.

The picture may be out of date, however. Sporadic community unhappiness about skill levels of entering employees in businesses or about failing scores on tests used to gain entrance to universities have led to mounting pressure on school boards and on state agencies that set standards for the skills imparted to students in school. Movements to base high school graduation on demonstrated competency rather than simply on credits earned or time spent have now spread from state to state. Programs to accelerate the learning of "gifted" students and to compensate for learning deficiencies of "disadvantaged" students

have been adopted in many communities. The federal government has now been involved for almost two decades in developing instructional technology, funding supplementary human resources, and demanding compliance with procedures for improving the achievement of low-income and minority students. It has now gone into exceptional students' procedural right to a public education. At present, courts direct school districts to improve achievement scores by so many points a year. In addition, there is a change in the self-perceptions of administrators and teachers, abetted by the emphases in professional training programs on accountability and teacher competence.

This evidence suggests a different picture of local school district policy -- one characterized by many contending forces and considerable ferment about what sorts and levels of achievement the schools should produce in students at various stages of their schooling careers. How this ferment over policy is focused and made to yield sets of goals and procedures for the management of instructional programs is the central question for this section of the paper.

We argue that administrators do the focusing. In addition to carrying out the policy decided upon by the school board, administrators are expected to shape those policy decisions. Thus, the philosophy about schooling brought to the job by new administrators will affect the way that policy currents are articulated and synthesized for boards to act upon. As mentioned before, professional training programs and associations act through local administrators to shape policy. (The same statement is

true of teachers and will become important as we explore the policy formation process.) The initial expectation for leadership in policy initiatives depends upon the composition of school boards and the criteria used to select among candidates. Something like the Presidential "honeymoon" operates to allow new administrators to bring about policy changes in spite of institutional inertia. As administrators become more experienced, the maneuvering room probably depends upon their acumen in discerning the possible coalitions among constituents and in mobilizing sufficient power for change so as to overcome inertia.

We have indicated the formal mechanism of district policy adoption, the informal political milieu in which this mechanism operates, and the active role played by administrators in orchestrating the synthesis of policy voices. The paradigm needs a construct that captures the evolution of this process over time. It is tempting to use a normative model of problem-solving such as has been advanced by Duke and colleagues (1980) to describe school decision-making. The important terms would be identification of the problem, search for solutions, and rational choice of solution. This technical model of policy formation plays a part in the evolution of district policy, particularly in large districts with specialized planning structures. However, Zeigler's model of policy formation (Tucker and Zeigler 1980a) is more realistic and comprehensive. The important terms of this model are:

Proposal development
Executive recommendation
Legislative action
Supplementary decision and implementation
Review

Zeigler allows for initiation of proposals by any of the political actors with an interest in district policy, but he finds that most proposals are introduced by the administrative cadre rather than by community interest groups. The process of executive recommendation allows the superintendent to assess the political astuteness as well as technical adequacy of the proposal and to seek to remedy each prior to seeking formal school board decision. The legislative action phase is another opportunity for political forces to alter or neutralize context about the decision. Legislative action directs administrators to carry out certain tasks, but continuing politicization of a decision -- accomplished through formal appeal procedures or persuasion to a different point of view or removal of board members -- may place plans for implementation in limbo for a time. Assuming that plans are implemented, the cyclical nature of school operations and school politics means that there are likely to be future challenges to the decision and, hence, the effects of implementation must be subject to continual review. At each stage of policy formation, there are opportunities for improving the rationality of the policy, but there are also opportunities for sacrificing technical rationality to political expediency. Inclusion of this construct in the paradigm allows us to direct attention to the sources and vectors of environmental impact on policy, to ascertain the interpretation of policy by administrators, and to identify effective and ineffective administrative strategies for obtaining the policies that administrators want.

Zeigler has argued that policies that represent substantial departures from precedent are likely to arouse the most political opposition, and that administrators will broaden participation in proposal development and implementation in order to coopt such opposition. In addition, Herriott and Gross' (1979) studies of implementation suggest the importance of creating an awareness of the problem before offering a solution. Widespread recognition of a problem can be increased by appointing a broadly-based committee to study the problem. Furthermore, Berman and McLaughlin's (1978) research indicates the importance of broad mobilization of resources for the continuation of a project once the initial implementation cycle (and initial infusion of resources) is over.

The problem with broad participation is that policy may remain vague or diffuse to the point that implementation is unclear or impossible. There is the danger of seeking the sort of universal consensus that Meyer and his colleagues found so enervating to crisp policy changes. Perhaps it is preferable to accept the perennial conflict of pluralistic policy voices and undertake limited but well-focused policy changes with a greater emphasis on technical planning.

Teachers are apt to be more sensitive to the departure from precedent than any other actor in the policy process. Moreover, teachers may contribute the strongest political support of and best technical resources for policy changes aimed at improving student achievement. Hence research on proposal development and planning for implementation should include a study of teachers' involvement in such cases. Without

teachers' acceptance of resulting policy or strong pressure from other quarters, administrators are unlikely to be able to implement a new program feature.

There are three general categories of policy that should be studied under the proposed paradigm. First, there are policies that define general features of work structures for teachers and students -- e.g., achievement, goals, resource allocation formulas, and incentive contingencies. These policies are important because they communicate the intended operations of classrooms and allow administrators to bring pressure to bear upon teachers and students who fall short. Second there are policies that empower and delimit discretion by administrators in carrying out procedures to realize the first sort of policy. These policies are important because they increase or decrease discretion as needed by the technical nature of tasks (Elmore 1979). Third, there are policies that divert administrative work to functions other than management of classroom work. These are important because they typically prevent administrators from exercising instructional leadership and because they foster competition for other school resources.

Some examples of policy changes that should be studied to reveal the optimum policy formation process would include recent attempts by many states to make districts define their educational goals more specifically. Broad community participation in such a goal definition process may result in meaningless generalities, whereas broad teacher participation may result in over-specification of technical details that are better left to teacher discretion. In each case, the correcting influence of administrative

viewpoints might result in policies more likely to be implemented. A similar dilemma can be observed in policy changes regarding curricular adoptions and the purchase of more advanced technical tools for instruction. In this respect, Fullan and Pomfret's (1977) advocacy of teacher participation in curricular policy making needs to be tempered in light of empirical evidence: teachers may over-commit themselves to specific changes rather than allow some managerial flexibility in modifying new policies according to implementation needs (Gross et al. 1971).

Other policies involve personnel and program evaluation, and the remediation or elimination of ineffective personnel and practices. These policies are usually inter-related with negotiations between districts and teacher unions. Recent research (Johnson 1981; Mitchell et al. 1981) raises the concern that it may become impossible to do anything about ineffective practices under new policies on administrative and teacher discretion.

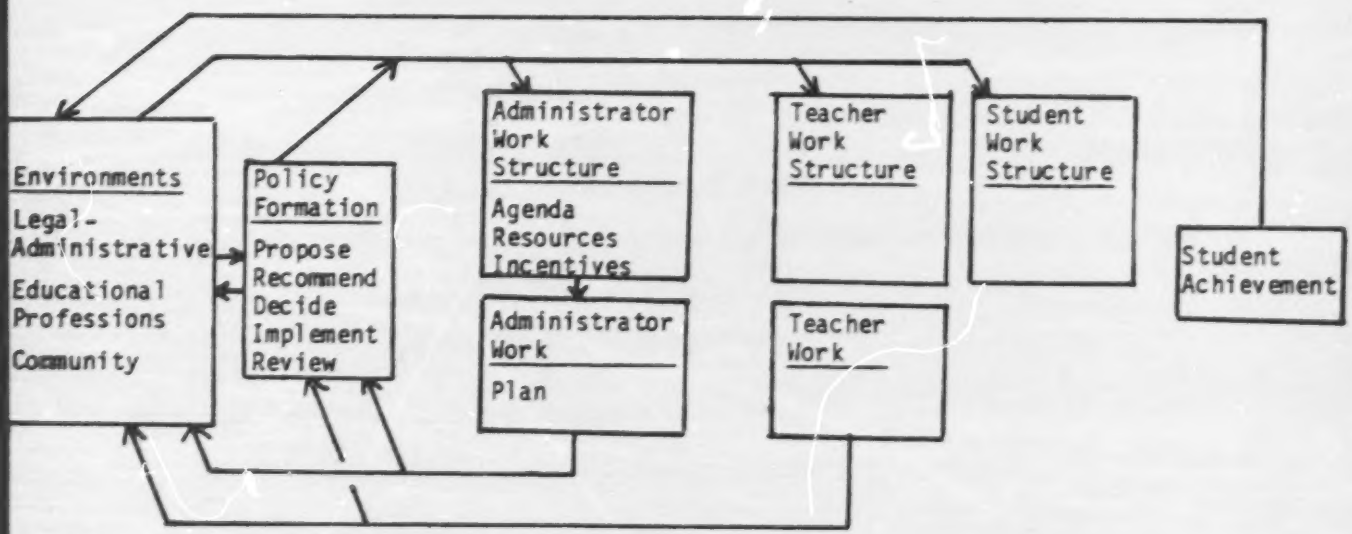
In addition to agenda-implicating policies, district policy on class size and administrative staff size will affect the resources available both to classroom work and to management work at the school level Bidwell and Kasarda (1975) found that the administrator-teacher ratio was negatively related to student achievement, although the study has been faulted on methodological grounds (Hannan, Freeman, and Meyer 1975). Murnane, on the other hand, has emphasized district policy regarding the assignment of students to schools and the assignment of teachers to students (1980). Given these findings, it would be particularly useful to know how district policy changes attempt to improve these variables.

Other important district policies govern the reporting of student performance to parents. When districts drop grades in favor of verbal comments, what is the effect on both teachers and students?

Where the policy formation process at the district level is faced with governmental compliance demands or legal injunctions, administrators have a different problem from obtaining intradistrict implementation of change. Initially, many of the governmental programs introduced in the last two decades were favored by administrators (Tucker and Zeigler 1980b) and may have strengthened their positions in pursuing changes -- many related to improved student achievement -- in the face of local opposition. However, the situation has changed. Today, there are so many governmental regulations that not only establish new policy goals, but also restrict administrative and teacher discretion in meeting those goals (e.g., P.L. 94-142) that administrators are seeking redress. Outright opposition is possible to overly-directive governmental pressure, especially where there are inadequate resources and exclusive reliance on coercion as an incentive. We should study the forms and consequences of such resistance. Administrators can use the political acumen that facilitates policy recommendations to their own boards in mobilizing coalitions that can overturn or modify some of the environmental pressures now facing them. We suspect that their success in involving community members and teachers in planning and implementing instruction-related changes will determine their effectiveness in mounting a political challenge to more distant policy constraints.

The discussion of educational policy and administrative work suggests a further development of the paradigm. We see policy formation as an interactive process involving environmental agents, administrators, and teachers. Further discussion of recent trends in the behavior of a variety of environmental agents is provided in other papers by researchers at the Center for Educational Policy and Management (Hersh et al. 1981; Kehoe et al. 1981; Lane and Kelly 1981). Through policy formation processes, environmental agents affect administrative work structures, teacher work structures, and student work structures. In turn, environmental agents are influenced by the work of administrators and teachers and by evidence of student achievement problems. These relationships are added to the paradigm in Figure 4.

Figure 4. Policy Formation in the CEPM Paradigm



III. School Management and Classroom Work

The main focus of paradigm development is how school and district administrative practices contribute to student achievement. In Section I, we attributed achievement to student work and the student work structure created by teachers and speculated on teacher work structure variables that might be influenced by administrative practices. In Section II, we described administrative work structure in terms of the district policy process which sets agenda, provides resources, and generates incentives for administrative work. The main focus may now be phrased as a question. How does administrative work affect the teacher work structure?

Dornbusch and Scott's (1975) conceptual framework for task control can help us here as it did in Section I, where the concern was teacher control of student work. District policy sets goals that require the assignment of tasks to different teachers and the specification of criteria for acceptable task performance. Some of these tasks and criteria will be sufficiently predictable that directives may be used regarding teacher work procedure. Other tasks and criteria require delegation to teachers of decisions about work procedure. Whatever the distribution of directives and delegations, however, task control requires subsequent sampling of teacher task performance and appraisal of outcomes according to established objectives. The sequence of tasks and objectives over the schooling career of students must be adjusted to reflect student achievement. All of these phases of task control typically involve administrative work. Moreover, all influence the teacher work structure variables discussed in Section I: agenda (coherence of tasks and tests); resources (students assigned to teacher, teacher ability to allocate time); and incentives (benefits for planning and instructional improvement).

Given the ambiguity and pluralism of district policy described in Section II, it is to be expected that administrators' attempts to translate policy into teacher work structures will be desultory and fragmented. Therefore, we begin this analysis of school management and classroom work with an account of the impact administrators have separately on teacher work agenda, resources, and incentives and variations in the strength of this impact. Then we consider the relatively rare case where district policy and/or curricular adoptions imply an integrated approach to managing teacher work agenda, resources, and incentives -- e.g., school-wide use of highly prescriptive instructional technologies like DISTAR. Finally, we generalize the insights derived from the integrated case to situations where tasks require delegation of decision-making to teachers. We suggest the outline of an effective administrative approach to ongoing program evaluation as a teacher work structure that can control teacher work and, consequently, student work in order to improve achievement.

Administrative control of the teacher work agenda involves specification of subjects to be taught by different teachers and materials to be used for each subject. Around the core subjects of language and mathematics, tradition provides a strong base for such specification. Also, administrators have considerable latitude in the emphasis given other subjects, particularly at the elementary level. It is possible to make social studies and science, for example, virtually marginal phenomena in elementary classroom instruction. Similarly, in the secondary school, administrators can emphasize basic skills development or content coverage in a number of courses involving the use of language and mathematical skills.

Although classroom observations may serve to evaluate agenda implementation, administrators often rely on lesson plans filed in advance by the teacher. Whether such lesson plans are inspected for the coherence of tests and tasks, however, is questionable. Also, schools vary in the detail of teacher record-keeping on work completed by students. Recent developments in school information technology (McIsaac 1979) allow for substantial centralization of record-keeping regarding student progress through the curriculum. Inasmuch as several states have mandated competency-oriented curricula, there may be increasing use of such computer technology by administration to control the work agenda in different classrooms.

It is important to determine whether administrators control agenda by delegation or by directive. In the first case, administrators may simply establish performance criteria for students -- or require teachers to establish such criteria -- and inspect end-of-year achievement. In the second case, administrators may direct use of instructional technology and rely on observation of teacher performance rather than, or in addition to, student achievement.

Administrative control of teacher work resources involves ascertaining that district priorities regarding the use of time (and other resources) for different tasks are being fulfilled; making sure that differential teacher resources, and the resources of other instructional personnel, go to the right students, and ensuring that teachers are prepared to teach different subjects and students at different levels of readiness. The

quantifiability of work resources may contribute to their being the object of mandates at the supra-district level (e.g., the use of Title I resources for eligible students) that in turn require administrators to ensure compliance at the classroom level.

Administrators can control resource use by inspecting lesson plans for allocation of time and by monitoring the work records of special instructional personnel to determine which students have been served. Observation can also help, although the problem of sampling is compounded where the question of duration of time allocated is at issue. Administrators have a larger role to play, however, in the enhancement of work resources in the classroom. Provision and management of supplementary skill instruction for students, organization of student progress evaluation systems that inform teachers about changing levels of readiness, and procural of technical assistance and inservice training to improve teacher skills are avenues for controlling the resources with which teachers have to work.

Administrative control of teacher work incentives affects the organizational climate. In order to ensure that teachers monitor and reinforce student work behavior, administrators have to communicate expectations and tolerances to classroom teachers. "Easy" or "tough" grading can be discussed on the basis of discrepancies between grades and other data about student achievement; similarly, teachers can be sustained or overruled in the use of punishments, particularly where parents complain. The ongoing organizational climate can be shaped through selective praise and censure

in public settings. It is clear, however, that classroom work incentives are the most difficult to control of the three major constructs and the task aspects that have to be delegated in most cases.

With respect to the separate management of teacher work agenda, resources, and incentives, we need to understand the type and strength of sanctions available to administrators in appraising teacher performance. In addition, we need to remember the other forces outside the classroom -- particularly special administrators at the district office -- that shape and constrain the influence of school principals. These points are linked. The formal sanctions available to administrators reflect the attitude of superintendents and other central office administrators towards task control and the importance of student achievement. Similarly, the informal approach to administrative task control depends to a great extent on the principal's ability to obtain support from district personnel for teachers' efforts. We shall discuss each of these in turn.

According to Dornbusch and Scott (1975), teachers' respect for sanctions available to administrators forms a critical condition for task control. An administrator's capacity for controlling the employment status of teachers would be analogous to the private employer's ability to hire and fire, promote and demote. In public schools, the range of administrative sanctions is narrow. Formal personnel evaluations lose most of their influence once the teacher has tenure, and financial incentives are largely based on seniority rather than merit

ratings. While formal personnel evaluation offer an occasion for the administrator to sample and appraise teacher compliance with policy on work agenda, resources, and incentives, the consequences of appraisal are usually informal. At most, teachers may be held accountable for improvement on specified points during the subsequent year, which undoubtedly allows for some leverage through the nuisance value of close supervision during the "remedial" period. Also, teachers may require inservice training or technical assistance, available through the district or elsewhere, which may also facilitate the administrator's resource enhancement strategy. However, the probability of significant teacher growth in such activities may be poor because of the coercion involved. The constraints placed on personnel evaluations by new contract language won through collective bargaining, moreover, inhibit administrators from using coercion and reinforce teachers in their resistance to the offered assistance. In particular, the nuisance value of grievance procedures. initiated by teachers protesting their evaluation or the conditions for remediation probably limits the impact of evaluation on clear-cut cases of teacher incompetence. Such cases, as Johnson (1980) has argued, are rare.

Although formal personnel evaluation and consequent sanctions are virtually impotent as a device for administrative control of teacher work, the ritual of evaluation and occasional use of sanctions undoubtedly maintains certain boundaries of teacher compliance with district policy. There is no question that the authority conferred upon administrators in such activities is symbolically important in making administrators' evaluations important to teachers (Dornbusch and Scott 1975), and the potential

nuisance value of any negative evaluation to teachers is more salient than faith in the protection of grievance procedures. Hence, the way that administrators use personnel evaluation -- in particular the fairness of performance sampling and preliminary warnings before formal sanctions are instigated -- is probably critical to all task control attempts.

The real substance of administrative task control, however, is to be found in informal interactions between administrators and teachers. From occasional observations in the classroom, conversations with teachers, discussions during committee and faculty meetings, and reports of parents and students, administrators develop extensive dossiers of "secrets" about teachers (Burlingame 1978). This knowledge can be used to manipulate (through threat to expose or to deprive) or to persuade (through an "I'm on your side" approach). Moreover, isolation with students makes teachers sensitive to personal interaction with and encouragement by administrators. Cohen and colleagues (1977) found teacher perception that principals worked closely with teachers on instruction to be a positive correlate of teacher job satisfaction. This close contact, however, assumed a supportive and informal nature rather than an evaluative and formal nature.

Confirmation of this argument comes from research on the impact of collective bargaining on administrative discretion. Johnson (1981) found that a collaborative spirit among administrators and teachers in some of the schools she studied allowed administrators to bend the rules of the contract in favor of certain school needs. The tenor of administrator-teaching relationships therefore needs to be included in studies of administrative attempts to improve instructional outcomes. However, this

climate factor needs to be qualified regarding the density of administrator-teacher interaction and its variation among teachers. Administrators who "sit in the office" (Wolcott 1973) and administrators who have a collective rather than differentiated relationship to teachers may not be as effective in using informal persuasion to control teacher work as administrators who are more adaptable and interactive.

Apropos the importance of sustained interaction between principals and district supervisory staff and teachers for improvement of instruction, we quote Fullan and Pomfret (1977, pp. 391):

> If there is one finding that stands out in our review, it is that effective implementation of social innovations requires time, personal interaction and contacts, inservice training, and other forms of people-based support. Research has shown time and time again that there is no substitute for the primacy of personal contact among implementers, and between implementers and planners/consultants, if the difficult process of unlearning old roles and learning new ones is to occur."

The strength of informal administrative influence on teacher work structure will depend upon teachers' perceptions that administrators are able and inclined to support teacher efforts to comply with suggestions about work agenda, resources, and incentives. Administrative support for teacher work takes various forms. Administrators can provide assistance to teachers in developing new curricula. They can persuade parents and students of the importance of teacher efforts to attain certain goals for student work. They can modify the work assignments of auxiliary personnel and the weekly time schedule in order to facilitate teachers' instructional needs. They can make inservice education opportunities available to teachers. Finally, they can modify district policy and mobilize community resources to support teachers' attempts to improve instruction. This supportive

function of administration is associated with teacher morale (Cohen et al. 1977) and presumably contributes to administrative influence on teacher work.

Administrative influence on student achievement will be greatest where it is directed not to isolated aspects of teacher work structure, but to an integrated teacher work structure linked to the student work structure. Consider the case of a district that had adopted a comprehensive instructional technology. Administrators would have the job of adapting the teacher work structure to the implementation needs of the technology. Two examples are the DISTAR program that has proven so successful with low-achieving students in low-income school populations and the Individually Guided Education (IGE) program also developed to deal with learning differences.

In the case of DISTAR, the totally-prescriptive nature of the program underlying the curricular task assignments to students means that task directives can be employed and the process observed and evaluated as well as the products. Resource teachers are used as intermediate performance observers and evaluators. Gersten and Carnine (1981), however, report that principals are reluctant to direct this type of teacher work structure. The cause for this reluctance to assume the task control afforded by DISTAR is not known. Perhaps it is too much of a role change to be implemented without strong central office pressure (and the pressure in many of the DISTAR sites seems to come from the federal government and the courts rather than from the central office). Perhaps the management information system, which would allow easy access to data on student progress and straightforward alteration of classroom work factors, is not yet adequate

to reasonably limit the time given to task control. On the other hand, it is possible that informal relationships among teachers and administrators would suffer through a directive approach, thus avoiding a negative incentive for administrators. Cohen and colleagues (1977), however, argue that teachers in the low-socioeconomic status schools that are likely to employ DISTAR might welcome a more directive administrator. Edmonds (1979) and Venezky and Winfield (1979) support this advocacy of stronger administrative control in low-achieving schools. Stallings (1979) also recommends administrative action to support direct instruction (although not in DISTAR, which remains experimental at the secondary level).

Individually Guided Education presents a contrast to DISTAR. IGE is interesting because it came pre-packaged with a very different format from the hierarchical task control structure employed by DISTAR. Decision-making about instruction -- indeed, virtually all control of classroom tasks -- was vested in a subunit of the school comprised of a team of teachers, specialists, and aides led by a team leader. Research on a number of schools using IGE found implementation to have mixed results and suggested an important role for the principal in both preparing for implementation and managing the actual process (Packard et al. 1978). Problems can arise when principals are not prepared to act as the coordinators or facilitators of semi-autonomous groups of teachers (Cohen et al. 1977). Where instructional programs require more delegation of decision making to teachers, it may be important to help such teacher groups establish policies for a team work structure that makes teacher efforts to manage student work complementary.

We conclude this section with a general discussion of the problems in managing the implementation of a coherent instructional program. We suspect that the majority of attempts by administrators to improve instruction in an integrated fashion rather than piecemeal will arise where delegation must be used because of the unpredictability of the task or the criterion and where the work agenda is an incremental improvement on the existing curriculum rather than the importation of a complete design. In addition, the pluralistic influences on policy practically dictate the watering down or hybridization of pure designs.

Several studies of implementation of curricular innovations have converged on a composite picture of successful implementation of federal programs (Berman and McLaughlin 1978; Fullan and Pomfret (1977). They reaffirm Gross's model of the management of implementation indicating that administrators needed to attend to clarity of teacher objectives, teacher training for new roles, and provision of materials and equipment required by teachers (Gross et al. 1971). These management tasks could be accomplished only through feedback from teachers during the implementation period. In addition, administrators were exhorted to adapt organizational conditions to the desired teacher work structures and to use incentives to maintain morale and commitment to the improvement effort. Here we have attention given to agenda and incentives. The attention to feedback reaffirms the preceding discussion about the importance of frequent, informal contacts between administrators and teachers attempting to improve instruction.

The Berman and McLaughlin study (1978) summarized data on a large number of federally-induced change efforts and identified the following implementation strategies as ineffective:

Reliance on outside consultants
Use of packed management approach
One-shot preimplementation training
Pay for training
Emphasis on formal evaluation
Over-comprehensive scope of project

In contrast, the researchers found the following to be elements of a successful implementation strategy:

Concrete, teacher-specific, ongoing training
Classroom assistance from district or project staff
Observation of project in other settings
Regular project meetings
Teacher participation in project decision making
Local materials development
Principal participation in training

These elements led to good working relationships among teachers attempting the improvement, active support of the project by the principal, and an effective project director. Such projects were continued after federal funding ceased.

These research findings have implications for the more general attempt to implement district policy regarding instructional outcomes. In particular, the "mutual adaptation" philosophy of successful projects fits the general situation of trying to implement different innovations in work agenda, resource allocation, and incentive maintenance. In their attempts to realize the new program, the administrators must be close enough to teachers to respond to requests for modifications in organizational environment or district policy; however, administrators must work in

essentially a delegative mode. We are encouraged by some of the more recent thinking going on in program evaluation circles about this work role for the administrator.

Program evaluation is a product of the federal programs for school improvement that have spawned implementation research. Indeed, it may be said that early evaluation attempts led to questions about the implementation of the program being evaluated and thus increased attention to the task control of local administrators. At the same time, it was realized that evaluations irrelevant to local management would be unlikely to influence local practice. Therefore, the construct of local decision-making became integrated into the thinking about program evaluation (Stufflebeam 1971).

Program evaluation has the formal quality of personnel evaluation and, indeed, is often perceived as a disguised attempt at personnel evaluation. This may be a consequence of the single-factor implementation activities of administrators, where teachers were faulted solely on achievement data of students or on isolated teaching variables such as use of class time to keep students busy. It is fair to say that teachers have always argued that administrative evaluation attempts were invalidated by simplistic views of teaching or by lack of knowledge of all the factors to be managed in any specific classroom.

The advantage of the integrated construct of classroom work structure -- agenda, resources, and incentives -- is that it calls attention to the inter-relatedness of instructional conditions and their existence apart

from the teacher as a person. Problems therefore become technical and solutions flow from improved design and trained execution of design rather than from personality change.

A synthesis needs to be worked out between the findings of implementation studies (e.g. Berman and McLaughlin 1978) and the findings of studies of district use of evaluation systems (e.g. Bank and Williams 1980). The focus on mutual adaptation and continuation is consistent with the concern for making evaluation useful to teachers in their instructional problems and to administrators in their policy and management activities. In both cases, over-emphasis on environmental audiences for program design and evaluation data was found to weaken the utility of the management and evaluation systems for instruction; it can be surmised that implementation and program improvement suffered.

We suspect that only by trying to evaluate instructional programs as work structures will administrators become able to improve them. This means uncovering the "bugs" in the program and matching program agenda to available resources. It means confronting problems and modifying programs to sustain teacher and student commitment to the learning task. It means identifying the organizational conditions or environmental factors that determine program effects and initiating policy revision processes to reduce interference. In short, administrators will discover the variables that distract from coherent work structures in particular classrooms as outlined in Section I.

Administrative success in supervising agenda, resources, and incentives in classrooms will depend on the closeness with which admini-

strators and teachers work together in adapting policies and analyzing problems. Where highly-developed technologies are not available to resolve curricular problems, administrative discretion and teacher discretion together have to solve them, and this will happen only in regular face-to-face interaction such as is provided by faculty meetings, curriculum committee meetings, and individualized staff development programs.

Administrators are probably well advised to approach the evaluation of classroom work structures from the perspective that directives about improvement are possible, they must also be prepared to recognize the necessity of delegation as well. The main question must always be whether the teacher work structure in question could be managed better by the teacher than by the administrator. Given the likelihood that teaching practices will always have to be adapted to the strengths and weaknesses of different teachers, they may be in a better position to judge the overall satisfaction of the necessary functions than administrators. However, they will only know to do this (or be motivated or equipped to do it) as a result of trying to do it for an evaluator. Thus, the attempt to evaluate not only informs the administrator about weaknesses in the program, but it also informs the teacher about ways to analyze classroom practices. If administrators and teachers can discuss these matters, they may be more likely to approach program improvement in the collaborative spirit described by Johnson (1981) than to have recourse to formal sanctions backed up by district policy, on the one hand, and union support in stating grievances, on the other hand.

Ultimately, teachers have to internalize the evaluation process and the management approach to classroom work structures. They

have to articulate their tasks, criteria, outcome samples, and appraisals. They will do this only if it brings no threat to personal status and the results not only improve their own efficacy but also, where needed, lead to modification in administrative practices and policy. The role of administrators in managing classroom work is thus primarily catalytic.

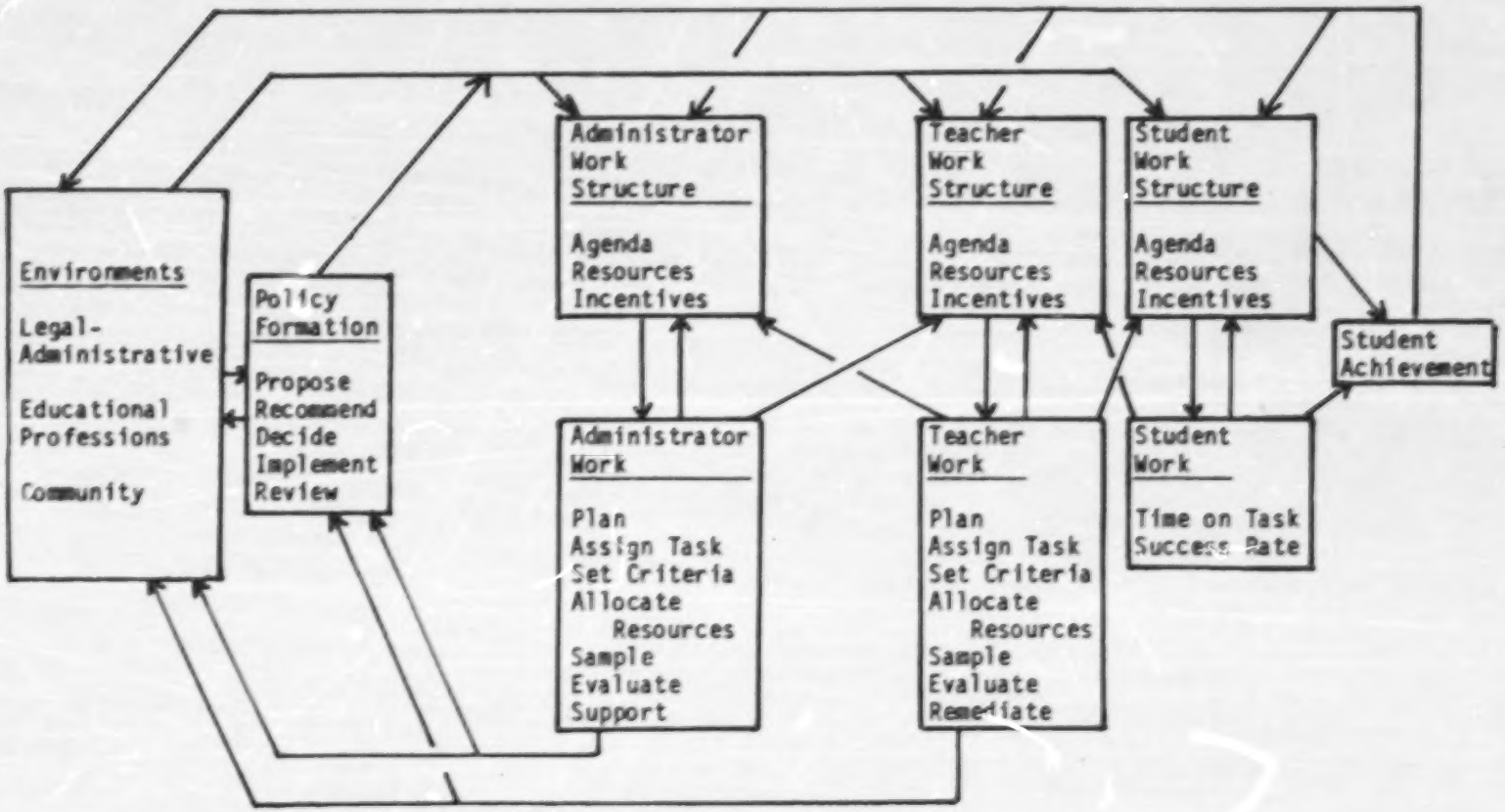
These administrative work skills require personal resources that must be developed by district leadership and administrative training programs. First, the administrators must be knowledgeable about the way that agenda, resources, and incentives combine in different classrooms. This means regular observation of instruction and training in the general curricular principles involved. Administrative inservice programs are likely to be necessary and must be endorsed by district leadership. Where specialists are employed in schools or districts, there needs to be clear understanding about the complementarity of administrators' and specialists' evaluations and advice to teachers. Second, administrators must be just in the distribution of work and criteria, fair in observation practices (e.g., allowing for unforeseen variation in teacher or student energy from day to day), and constructive in evaluation. Third, administrators must be able to trust teachers where delegation of authority is indicated and must communicate this trust.

We conclude this essay with a summary of the paradigm as it incorporates the points made in Section III. Administrative work is effective in improving student achievement when it establishes work structures for teachers that in turn lead teachers to establish effective work structures for students. This administrative function reflects the administrative work structure established by policy formation processes involving community,

teachers, and higher governmental agents. Effective administrative work includes interacting with teachers concerning the implementation of the teacher work structure and assisting teachers to modify that work structure as necessary. We encourage research on different approaches to supervision (directive, delegative), on administrative supports for teacher work, and on the interaction of informal persuasion, personnel evaluation, and program evaluation in providing feedback to teachers and redirecting their efforts. Finally, we emphasize the importance of administrators' transmitting the needs of teacher work structures back to policy formation and argue that this will be most effective where administrators work closely with teachers in managing those structures. The final amendments to the paradigm are shown in Figure 5 on the following page.

The impact of policy on student achievement and the efforts of teachers to improve such achievement depend on the administrative work practices discussed herein. Without better knowledge about the effects of variations in such practices, administrators will fail to realize their potential as instructional leaders.

Figure 5. The Full Research Paradigm



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